

## Avoiding a Crisis of Confidence in the U.S. Nuclear Deterrent

by John P. Caves, Jr.

### Key Points

**The United States needs to modernize and ensure the long-term reliability and responsiveness of its aging nuclear deterrent force and nuclear weapons infrastructure. It cannot otherwise safely reduce its nuclear weapons, responsibly ratify the Comprehensive Test Ban Treaty, confidently deter and contain challenges from rising or resurgent nuclear-armed near peers, and effectively dissuade allies and partners from acquiring their own nuclear weapons. Modernization is fundamental to avoiding a future crisis of confidence in the U.S. nuclear deterrent.**

### A Hypothetical Scenario

*In 2030, U.S. nuclear weapons scientists discover an anomaly during component testing of nuclear warheads used on U.S. submarine-launched ballistic missiles that raises serious doubts as to those warheads' reliability. These doubts arise when an increasingly assertive, nuclear-armed great power has been exerting pressure upon U.S. allies and partners in its region to reduce their defense cooperation with the United States, and has even made nuclear threats to that end. Whereas this increasingly assertive great power recently fielded new warheads on new delivery vehicles as part of a major modernization and expansion of its nuclear*

*forces, the United States still deploys only warheads and delivery systems built during or shortly after the Cold War. The United States has no existing capability to develop and produce new nuclear weapons, and it would take more than a decade to reconstitute that long-lapsed capability. The United States earlier had ratified the Comprehensive Test Ban Treaty (CTBT). The President is torn over whether to test explosively some existing warheads for reliability. Opposition to a withdrawal from or violation of our CTBT obligations would be intense, but reports of warhead failure already have leaked. While successful tests would allay concerns about warhead reliability, unsuccessful tests could lead allies and adversaries alike to conclude that the U.S. nuclear deterrent is no longer reliable.*

Perceptions of a compromised U.S. nuclear deterrent as described above would have profound policy implications, particularly if they emerge at a time when a nuclear-armed great power is pursuing a more aggressive strategy toward U.S. allies and partners in its region in a bid to enhance its regional and global clout.

■ A dangerous period of vulnerability would open for the United States and those nations that depend on U.S. protection while the United States attempted to rectify the

problems with its nuclear forces. As it would take more than a decade for the United States to produce new nuclear weapons, ensuing events could preclude a return to anything like the status quo ante.

■ The assertive, nuclear-armed great power, and other major adversaries, could be willing to challenge U.S. interests more directly in the expectation that the United States would be less prepared to threaten or deliver a military response that could lead to direct conflict. They will want to keep the United States from reclaiming its earlier power position.

■ Allies and partners who have relied upon explicit or implicit assurances of U.S. nuclear protection as a foundation of their security could lose faith in those assurances. They could compensate by accommodating U.S. rivals, especially in the short term, or acquiring their own nuclear deterrents, which in most cases could be accomplished only over the mid- to long term. A more nuclear world would likely ensue over a period of years.

■ Important U.S. interests could be compromised or abandoned, or a major war could occur as adversaries and/or the United States miscalculate new boundaries of deterrence and provocation. At worst, war could lead to state-on-state employment of weapons of mass destruction (WMD) on a scale far more catastrophic than what nuclear-armed terrorists alone could inflict.

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## Continuing Salience of Nuclear Weapons

Nuclear weapons, like all instruments of national security, are a means to an end—national security—rather than an end in themselves. Because of the catastrophic destruction they can inflict, resort to nuclear weapons should be contemplated only when necessary to defend the Nation's vital interests, to include the security of our allies, and/or in response to comparable destruction inflicted upon the Nation or our allies,

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almost certainly by WMD. The retention, reduction, or elimination of nuclear weapons must be evaluated in terms of their contribution to national security, and in particular the extent to which they contribute to the avoidance of circumstances that would lead to their employment.

Avoiding the circumstances that could lead to the employment of nuclear weapons involves many efforts across a broad front, many outside the military arena. Among such efforts are reducing the number of nuclear weapons to the level needed for national security; maintaining a nuclear weapons posture that minimizes the likelihood of inadvertent, unauthorized, or ill-considered use; improving the security of existing nuclear weapons and related capabilities; reducing incentives and closing off avenues for the proliferation of nuclear and other WMD to state and nonstate actors, including with regard to fissile material production and nuclear testing; enhancing the means to detect and interdict the transfer of nuclear and other WMD and related materials and capabilities; and strength-

ening our capacity to defend against nuclear and other WMD use. For as long as the United States will depend upon nuclear weapons for its national security, those forces will need to be reliable, adequate, and credible.

Today, the United States fields the most capable strategic nuclear forces in the world and possesses globally recognized superiority in any conventional military battlespace. No state, even a nuclear-armed near peer, rationally would directly challenge vital U.S. interests today for fear of inviting decisive defeat of its conventional forces and risking nuclear escalation from which it could not hope to claim anything resembling victory. But power relationships are never static, and current realities and trends make the scenario described above conceivable unless corrective steps are taken by the current administration and Congress.

Consider the challenge posed by China. It is transforming its conventional military forces to be able to project power and compete militarily with the United States in East Asia,<sup>1</sup> and is the only recognized nuclear weapons state today that is both modernizing and expanding its nuclear forces.<sup>2</sup> It weathered the 2008 financial crisis relatively well, avoiding a recession and already resuming robust economic growth.<sup>3</sup> Most economists expect that factors such as openness to foreign investment, high savings rates, infrastructure investments, rising productivity, and the ability to leverage access to a large and growing market in commercial diplomacy are likely to sustain robust economic growth for many years to come, affording China increasing resources to devote to a continued, broad-based modernization and expansion of its military capabilities. In contrast, the 2008 financial crisis was the most severe for the United States since the Great Depression,<sup>4</sup> and it led in 2009 to the largest Federal budget deficit—by far—since the Second World War<sup>5</sup> (much of which is financed by borrowing from China). Continuing U.S. military operations in Iraq and Afghanistan are expensive, as will be the necessary refurbishment of U.S. forces when those con-

flicts end. Those military expenses, however, are expected to be eclipsed by the burgeoning entitlement costs of the aging U.S. “baby boomer” generation.<sup>6</sup> As *The Economist* recently observed:

*China's military build-up in the past decade has been as spectacular as its economic growth. . . . There are growing worries in Washington, DC, that China's military power could challenge America's wider military dominance in the region. China insists there is nothing to worry about. But even if its leadership has no plans to displace American power in Asia . . . America is right to fret this could change.*<sup>7</sup>

As an emerging nuclear-armed near peer like China narrows the wide military power gap that currently separates it from the United States, Washington could find itself more, rather than less, reliant upon its nuclear forces to deter and contain potential challenges from great power competitors. The resulting security dynamics may resemble the Cold War more than the U.S. “unipolar moment” of the 1990s and early 2000s.

## Concerns about Long-term Reliability

With continuing U.S. dependence upon nuclear forces to deter conflict and contain challenges from (re-)emerging great power(s), perceptions of the reliability, adequacy, and credibility of those forces will determine how well they serve those purposes. Perception is all important when it comes to nuclear weapons, which have not been operationally employed since 1945 and not tested (by the United States) since 1992, and, hopefully, will never have to be employed or tested again. If U.S. nuclear forces are to deter other nuclear-armed great powers, the individual weapons must be perceived to work as intended (reliability), the overall forces must be perceived as adequate to deny the adversary the achievement of his goals regardless of his actions (adequacy), and U.S. leadership must be perceived as prepared to employ the forces under conditions that it has communicated via its declaratory policy (credibility).

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These perceptions must be, of course, those of the leadership of adversaries that we seek to deter (as well as of the allies that we seek to assure), but they also need to be those of the U.S. leadership lest our leaders fail to convey the confidence and resolve necessary to shape adversaries' perceptions to achieve deterrence. Weapons reliability is the essential foundation for deterrence since there can be no adequacy or credibility without it.

Reliability is a serious emerging issue for U.S. nuclear weapons. As Secretary of Defense Robert Gates observed, "No one has designed a nuclear weapon in the United States since the 1980s, and no one has built a new one since the early 1990s."<sup>8</sup> Indeed, the United States is the only nuclear weapons state party to the Nuclear Nonproliferation Treaty (NPT) that does not have the capability to produce a new nuclear warhead.<sup>9</sup> Russia, China, and France currently are modernizing their nuclear weapons systems, and the United Kingdom has decided to replace its current *Vanguard*-class ballistic missile submarines and is investing in the sustainment of its nuclear warhead maintenance and replacement capabilities.<sup>10</sup> In lieu of a nuclear weapons production infrastructure and nuclear testing, the United States relies upon its Stockpile Stewardship Program (utilizing computer simulation and component testing) to evaluate and validate the continued viability of existing warheads; service life extension programs to prolong the operational life of warheads (and delivery vehicles); and a stockpile of nonoperationally deployed warheads to provide spares for destructive component testing under the Stockpile Stewardship Program and a reserve to be pressed back into service to augment operationally deployed warheads, if deemed necessary.

The Achilles' heel of this current approach to ensuring the reliability of U.S. nuclear forces is the possible advent of critical systemic failure(s) in entire classes of aging warheads. That such failures could occur can be anticipated as a general matter for any aging system, particularly one that is no longer physically tested as a complete assembly. Specific failures, however, cannot be accurately forecast since the United States has no prior experience with warheads of this

age. The potential for such failures emerging is increased by the relatively narrow performance margins to which the warheads were engineered by Cold War nuclear weapons designers tasked with maximizing the number and explosive power of warheads that could be delivered by a ballistic missile.<sup>11</sup>

U.S. nuclear weapons scientists have warned of this problem for years.<sup>12</sup> The preceding administration proposed to address this problem by reconstituting and exercising the infrastructure needed to develop and produce nuclear weapons. The proposal involved both facilities (consolidation, refurbishment, and replacement), work force (maintenance of highly specialized nuclear weapons skills), and nuclear weapons design, development, and production work (for refurbishment and replacement of existing warheads). The Department of Energy's National Nuclear Security Administration, which is responsible for the nuclear weapons infrastructure, expected that the infrastructure transformation plan could be implemented within its existing budget projections if the savings realized from the plan were allowed to be reinvested into the infrastructure.<sup>13</sup> While some aspects of the proposed new infrastructure have moved forward (for example, the National Ignition Facility), much of the plan has not because Congress has declined to provide the requisite funding.<sup>14</sup>

Of particular significance, Congress withheld funding for the previous administration's proposed Reliable Replacement Warhead (RRW) program. Under this program, one or more new types of nuclear warheads would have been developed and produced, if the designs were validated by experts, to replace existing warheads. The new warhead design(s) would have been based on previously tested and proven designs but would have incorporated increased performance margins, safer materials, and improved security controls. It was anticipated that the new warheads also could permit a reduction in the number of warheads maintained in reserve by virtue of their designs being considered more reliable *over the long term* than existing ones (which are reliable today) and the associated reconstitution of the U.S. capac-

ity to produce additional weapons, should the need arise, thus supporting the further reduction in the overall number of U.S. nuclear weapons.<sup>15</sup> RRW also was expected to result in lower life cycle costs for the weapons by eliminating some processes needed to maintain existing weapons.<sup>16</sup>

A lack of consensus and trust underlay the standoff between the preceding administration and Congress over RRW. Many Americans, including many of their representatives, desire a world in which nuclear weapons would be less salient to security and the weapons could be reduced and eventually eliminated. Indeed, almost all of the world's nations, including the United States, have formally embraced that aspiration as part of the Nuclear Nonproliferation Treaty. Aspects of the preceding administration's early nuclear weapons policy were interpreted by some as increasing the role of nuclear weapons in U.S. security strategy by articulating new missions for nuclear weapons (in particular, holding at risk hardened and deeply buried strategic targets of WMD-armed rogue nations) and proposing the investigation of modified or new types of nuclear weapons systems that would be more capable of accomplishing those missions (for example, Robust Nuclear Earth Penetrator and new, low-yield nuclear weapons). The administration unsuccessfully argued that such critics had fundamentally misinterpreted the intent of its nuclear

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weapons policy.<sup>17</sup> Rebuffed, it eventually stopped pressing its controversial proposals to make U.S. nuclear weapons more capable and instead put forward RRW as a means to make those weapons reliable for the long term. Yet it proved too difficult for the administration to disassociate RRW from the earlier controversies.

Part of the preceding administration's problems in persuading Congress of the merits of its nuclear weapons enterprise proposals can be attributed to a paucity of senior policymakers in the Defense Department and the White House who had sufficient expertise on, and devoted the requisite attention to, nuclear weapons issues.<sup>18</sup> This has been a growing weakness of both civilian and military leadership as the nuclear mission has been eclipsed since the end of the Cold War. Fewer and fewer military and civilian defense leaders have professional experience with the nuclear mission. The military's neglect of the nuclear mission recently was highlighted by the Air Force's unintentional transportation of nuclear weapons across the United States and various Defense Department activities' involvement in the unwitting transfer of components for nuclear-capable ballistic missiles to Taiwan. The disciplinary action taken by Secretary Gates, including firing the Secretary and Chief of Staff of the Air Force, and the Schlesinger Commission's report on these incidents, make clear the need for the national security community to refocus on the critical nuclear mission.<sup>19</sup>

## Search for Consensus

Congress deferred key decisions on the future of U.S. nuclear weapons, including RRW, until after the incoming administration could address these issues. The Congressional Commission on the Strategic Posture of the United States was established to provide outside advice to Congress and the new administration on these matters and to inform the administration's Nuclear Posture Review, which is to be submitted by early 2010.

In March 2009, the Obama administration formally terminated the RRW program.<sup>20</sup> In May 2009, the Strategic Posture Commission delivered its report. That report did not seek to resurrect RRW but made it clear that the current reliance on stockpile stewardship and life extension programs will not suffice over the long term. It explained that a spectrum of options exists for ensuring the arsenal's long-term reliability that ranges from the pure remanufacturing of existing warheads with existing components at one end to complete redesign and new produc-

tion of all system components at the other. Rather than apply a single solution to the entire arsenal, it advocated applying whatever technical option along this spectrum is most appropriate for each type of warhead and consistent with broader U.S. nuclear weapons policy.<sup>21</sup>

The deliberations of the Obama administration and Congress on the future role and structure of U.S. nuclear forces also will play out against the backdrop of the popular vision of a "world free of nuclear weapons," which former Secretaries of State George Schultz and Henry Kissinger, former Secretary of Defense William Perry, and former Senator Sam Nunn initially called for in January 2007.<sup>22</sup> President Obama embraced this vision and the associated special responsibility of the United States to lead the world in that direction. He concedes that achieving the actual elimination of all nuclear weapons is a difficult and long-term task, something that may not be attained in his lifetime, but contends that articulating the vision and taking practical steps toward its achievement are essential to containing and reversing the ongoing proliferation of nuclear weapons capabilities and to reducing the likelihood that such weapons will be used. However, President Obama also pledged to maintain a safe, secure, and effective nuclear arsenal to deter adversaries and to guarantee the defense of our allies as long as nuclear weapons exist.<sup>23</sup> The President further has disavowed the development of any new nuclear weapons.<sup>24</sup> It is not yet clear how he will reconcile these various commitments.

Many other political leaders, including in the Congress and abroad, also have enthusiastically embraced the vision of a nuclear-free world. That vision, however, leaves some fundamental issues undressed. First, it tends to assume that the world will follow if the United States leads toward nuclear disarmament. Many states no doubt would—most do not have nor currently plan to acquire nuclear weapons—but it is by no means evident that the states that most need to follow would do so. Iran and North Korea long have defied the expressed will of the international community in pursuing their nuclear weapons programs. Nuclear forces are central to Russia's

concept of national power, enjoy pride of place in their ongoing defense modernization efforts, and are brandished even today against U.S. allies and partners. Despite its call for abolition of nuclear weapons, China is the only recognized nuclear weapons state that is both modernizing and expanding its nuclear forces. Neither Russia nor China could be expected to join the United States in

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eliminating nuclear weapons as long as the United States (or any other power) enjoyed clear conventional military superiority. And if one or both of those countries gained conventional parity with the United States, the vision does not address what, in the absence of nuclear weapons, would preclude the return of great power conventional war, such as devastated the world twice in the 20<sup>th</sup> century. Perhaps that is because implicit in the vision is what is more explicit in Article VI of the Nuclear Nonproliferation Treaty: that nuclear disarmament is something that would be accomplished in conjunction with general disarmament, a noble but even more ambitious goal.

The biggest potential risk associated with the vision of a nuclear-free world, however, is that it will be used as a reason for inaction on the modernization needs of U.S. nuclear forces today. Why modernize U.S. nuclear forces if the goal is to get rid of all nuclear weapons? The reality is, as previously discussed, that geopolitical developments actually could increase rather than decrease U.S. dependence on nuclear weapons to deter and contain challenges from nuclear-armed great powers, and that a failure to modernize U.S. nuclear forces in a timely manner risks technical developments that may fundamentally call into question the reliability of those forces. That, of course, would seriously

compromise the security of the United States and its allies.

The United States can modernize its nuclear forces to enhance their reliability while still providing leadership for the world toward reducing, and perhaps one distant day even eliminating, nuclear weapons while instituting other practical measures to halt nuclear weapons proliferation and avoid the employment of such weapons. Redesigned or refurbished nuclear warheads that are no more militarily capable but that are more reliable, safe, and secure than existing weapons can replace those aging warheads and enable reductions in the overall number of nuclear weapons the United States must retain to ensure its security.

## What Needs to be Done

The United States should undertake the following four actions:

- Build a smaller, safer, and more secure U.S. nuclear deterrent force that will be reliable over the long term. Reconstitute the U.S. capability to develop and produce nuclear weapons so the United States can undertake the necessary modernization of its aging nuclear arsenal. Authorize and fund a program to replace existing warheads with ones that are safe, secure, more easily manufactured, and reliable over the long term, which would make it less likely that the United States would need to resume nuclear testing, and which would enable the safe reduction in the number of warheads the United States must keep in reserve to meet new or greater threats that may emerge in the future. Modernize U.S. strategic delivery vehicles.

- Accord and sustain a high policy priority to U.S. nuclear weapons issues. Ensure that senior policy officials in the White House and the Defense, Energy, and State Departments accord and sustain a high policy priority to U.S. nuclear weapons issues. Ensure that military and civilian leaders at all levels with responsibilities for nuclear weapons issues have professional experience with or adequate education on these matters.

- Forge a new national consensus on the role of nuclear weapons in U.S. national security. Those senior policy officials, especially

in the White House and Defense Department, need to engage Congress and public opinion leaders to reach a shared understanding on the role of U.S. nuclear weapons and the shape of the future U.S. nuclear posture. Recognize that nuclear weapons will remain an indispensable element of national security policy for the foreseeable future, particularly given the potential for nuclear-armed near peers to reduce the military gap with the United States and become more assertive on the world stage. Recognize that a reliable, adequate, and credible U.S. nuclear force posture over the long term is essential to maintaining the security of not only the United States but also of its allies, and in dissuading those allies from acquiring their own nuclear weapons.

- Provide leadership to reduce the dangers that nuclear weapons pose to U.S. national security. As President Obama already has already done or is on course to do: reaffirm the U.S. commitment to the full implementation of the nuclear nonproliferation regime; actively pursue with Russia a follow-on agreement to the Strategic Arms Reduction Treaty that carries forward its most valuable aspects (including binding and verifiable arms reduction obligations), advances nuclear arms reduction to safe levels below those established in the Moscow Treaty, and contributes to a posture that minimizes the likelihood of accidental, unauthorized, or ill-considered nuclear weapons employment; develop a strategy for bringing other nuclear weapons states into a future nuclear arms control and reduction framework; reduce incentives and close off avenues for nuclear weapons proliferation, including with regard to fissile material production and nuclear testing; enhance national and international

capacity and cooperation to detect and interdict nuclear and other WMD and related capabilities and materials; and strengthen defenses against nuclear and other WMD.

The Nation risks a future crisis of confidence in its nuclear deterrent if it does not initiate soon the lengthy process of modernizing its nuclear arsenal and supporting infrastructure. Notwithstanding the goal of reducing the role of nuclear weapons in U.S. security strategy, nuclear weapons will remain highly salient to the Nation's security for the foreseeable future, particularly as one or more nuclear-armed near peers narrow the

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gap that currently separates our conventional military power. By modernizing its aging nuclear weapons and supporting infrastructure, the United States can more confidently ensure its own and its allies' future security with fewer, safer, and more secure nuclear weapons that are less expensive to maintain than existing ones. It also can ratify and pursue entry into force of the CTBT with greater confidence. The United States can set an

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example of responsible force modernization that moves toward a nuclear weapons-free future for the other recognized nuclear weapons states, all of which already are pursuing their own force modernization.

The Obama administration commendably has committed to a number of measures to reduce the risks posed by nuclear weapons, many of which will be addressed at the Global Summit on Nuclear Security that it is convening in April 2010 and at the NPT Review Conference the following month. But the Obama administration has not yet revealed its hand with regard to the future of the U.S. nuclear deterrent. This President and this Congress need to choose wisely and commit the requisite leadership and resources to ensuring a reliable and credible U.S. nuclear deterrent for decades to come.

## Notes

<sup>1</sup> Office of the Secretary of Defense, *Annual Report to Congress: Military Power of the People's Republic of China 2008*, Executive Summary, 1. Also of note, Admiral Robert F. Willard, Commander, U.S. Pacific Command, recently observed, "I would contend that in the past decade or so, China has exceeded most of our intelligence estimates of their military capability and capacity every year. They've grown at an unprecedented rate in those capabilities." See Bill Gertz, "Inside the Ring," *The Washington Times*, November 5, 2009, B1. ADM Willard's remarks were made to reporters in Seoul, Republic of Korea, on October 21, 2009.

<sup>2</sup> U.S. Department of Defense and U.S. Department of Energy, Joint Report, *National Security and Nuclear Weapons in the 21<sup>st</sup> Century*, September 2008, 1.

<sup>3</sup> See "Asia Recovering Rapidly, but Faces Challenges," says IMF," *International Monetary Fund (IMF) Survey Magazine* (October 29, 2009), chart entitled "Asia rebounding," footnote 1, available at <[www.imf.org/external/pubs/](http://www.imf.org/external/pubs/)

ft/survey/so/2009/CAR102809A.htm>; and Takatoshi Kato, Deputy Managing Director, International Monetary Fund, keynote speech at the Korean International Financial Association First International Conference, Seoul, Korea, October 16, 2009.

<sup>4</sup> David Wheelock, "Ask an Economist," *The Regional Economist*, U.S. Federal Reserve Bank of St. Louis, available at <[http://research.stlouisfed.org/publications/regional/09/07/reader\\_exchange.pdf](http://research.stlouisfed.org/publications/regional/09/07/reader_exchange.pdf)>.

<sup>5</sup> Congressional Budget Office (CBO), "The Budget and Economic Outlook: An Update," August 2009, 1, available at <[www.cbo.gov/ftpdocs/105xx/doc10521/2009BudgetUpdate\\_Summary.pdf](http://www.cbo.gov/ftpdocs/105xx/doc10521/2009BudgetUpdate_Summary.pdf)>. CBO predicted a 2009 budget deficit at the time of \$1.6 trillion, corresponding to 11.2 percent of gross domestic product (GDP). According to the Final Monthly Treasury Statement for fiscal year 2009 ([www.fms.treas.gov/mts/mts0909.pdf](http://www.fms.treas.gov/mts/mts0909.pdf)), the 2009 deficit was \$1.4 trillion, but that was still 10 percent of GDP. The second highest deficit since World War II as a percentage of GDP was 6 percent in 1983, per Historical Tables, Budget of the United States Government, Fiscal Year 2008, available at <[www.whitehouse.gov/omb/budget/fy2008/pdf/hist.pdf](http://www.whitehouse.gov/omb/budget/fy2008/pdf/hist.pdf)>.

<sup>6</sup> Congressional Budget Office, 4.

<sup>7</sup> "A wary respect, a special report on China and the United States," *The Economist*, October 24, 2009, 4, available at <[www.economist.com/specialreports/PrinterFriendly.cfm?story\\_id=14678579](http://www.economist.com/specialreports/PrinterFriendly.cfm?story_id=14678579)>.

<sup>8</sup> Robert M. Gates' remarks at the Carnegie Endowment for International Peace, Washington, DC, October 28, 2008.

<sup>9</sup> *National Security and Nuclear Weapons in the 21<sup>st</sup> Century*, 19.

<sup>10</sup> *Ibid.*, 5, 9.

<sup>11</sup> Nuclear Weapons Complex Assessment Committee, American Academy for the Advancement of Science, Center for Science, Technology, and National Security, "The United States Nuclear Weapons Program, The Role of the Reliable Replacement Warhead," April 2007, 17.

<sup>12</sup> For example, see *National Security and Nuclear Weapons in the 21<sup>st</sup> Century*, 17, and "The United States Nuclear Weapons Program, The Role of the Reliable Replacement Warhead," 14–16.

<sup>13</sup> Thomas P. D'Agostino, Administrator, National Nuclear Security Administration, "Complex Transformation and Strategic Weapons in the 21<sup>st</sup> Century," delivered at the Los Alamos National Laboratory/Lawrence Livermore National Laboratory Conference on Strategic Weapons in

the 21<sup>st</sup> Century, January 31, 2008. D'Agostino also observed, "Delay and inaction will only increase the costs and elevate the risks associated with maintaining an ageing stockpile."

<sup>14</sup> Thomas P. D'Agostino, Administrator, National Nuclear Security Administration, U.S. Department of Energy, statement before the House Committee on Armed Services, Subcommittee on Strategic Forces, February 27, 2008.

<sup>15</sup> *Ibid.*

<sup>16</sup> D'Agostino, "Complex Transformation and Strategic Weapons in the 21<sup>st</sup> Century."

<sup>17</sup> The preceding administration explained that the intent of its nuclear weapons policy was to reduce U.S. dependence upon nuclear weapons through greater reliance upon precision conventional weapons and missile defenses. It also explained that it sought to reduce the overall number of U.S. nuclear weapons by relying more on a reconstituted ability to produce new weapons than on a large reserve of existing weapons and by making the nuclear weapons that were retained more relevant to post–Cold War threats.

<sup>18</sup> This challenge is discussed further in Paul I. Bernstein, John P. Caves, Jr., and John F. Reichart, *The Future Nuclear Landscape*, Center for the Study of Weapons of Mass Destruction Occasional Paper 5 (Washington, DC: National Defense University Press, April 2007), 29–30.

<sup>19</sup> See the *Report of the Secretary of Defense Task Force on DoD Nuclear Weapons Management, both Phase I: The Air Force's Nuclear Mission (September 2008)*, and *Phase II: Review of the DoD Nuclear Mission* (December 2008).

<sup>20</sup> *America's Strategic Posture: The Final Report of the Congressional Commission on the Strategic Posture of the United States* (Washington, DC: United States Institute of Peace Press, 2009), 41.

<sup>21</sup> *Ibid.*, xvii–xviii.

<sup>22</sup> George P. Shultz, William J. Perry, Henry A. Kissinger, and Sam Nunn, "A World Free of Nuclear Weapons," *The Wall Street Journal*, January 4, 2007, A15.

<sup>23</sup> Remarks by President Barack Obama in Hradcany Square, Prague, Czech Republic, April 5, 2009, available at <[www.whitehouse.gov/the\\_press\\_office/Remarks-By-President-Barack-Obama-In-Prague-As-Delivered](http://www.whitehouse.gov/the_press_office/Remarks-By-President-Barack-Obama-In-Prague-As-Delivered)>.

<sup>24</sup> Peter Eisler, "Nuclear Weapons Decision Awaits Obama," *USA Today*, December 9, 2008, available at <[www.usatoday.com/news/military/2008-12-08-obamanuke\\_N.htm](http://www.usatoday.com/news/military/2008-12-08-obamanuke_N.htm)>.

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